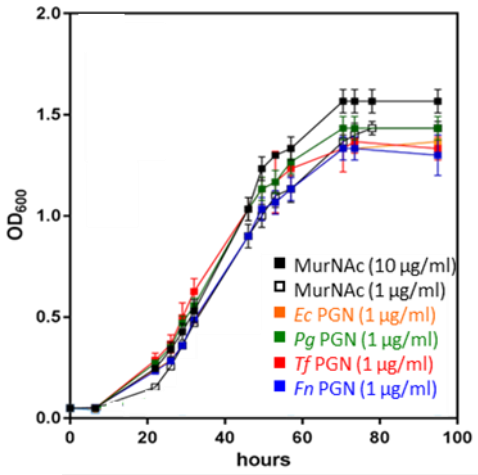
Investigation of the Survival Strategy of the Oral Pathogen *Tannerella forsythia*

PI: Fiona F. Hager-Mair (BOKU Vienna); Project: H855942020)
Hochschuljubiläumsfonds der Stadt Wien

Tannerella forsythia has a unique status among the periodontal pathogens, because it strictly depends on the supply of the peptidoglycan (PGN) cell wall sugar *N*-acetylmuramic acid MurNAc for viability and proliferation. We hypothesize that *T. forsythia* scavenges peptidoglycan from cohabiting oral biofilm bacteria, possibly involving secreted lytic enzymes to access it. A peptidoglycan recycling locus on the *T. forsythia* genome provides candidates for peptidoglycan import and degradation for channelling exogeneous fragments into peptidoglycan biosynthesis.

We will study how exogeneous PGN can be accessed by *T. forsythia*, as well as identify and characterize enzymes involved in PGN processing, and clarify how PGN fragments are imported via the outer membrane barrier, possibly involving a putative SusC/SusD outer membrane transporter that is encoded immediately upstream of the PGN recycling locus on the *T. forsythia* genome. Finally, a simplified biofilm model mimicking the situation in the natural habitat will allow to gain an understanding of how *T. forsythia* can benefit from the cohabiting biofilm bacteria.



T. forsythia grown with free MurNAc and peptidoglycan (PGN) from different bacteria. © Valentina Mayer, Schäffer

The knowledge gained within the frame of this project does not only constitute a necessary step for understanding how this pathogen thrives in the oral habitat but can also inform about novel strategies to combat periodontitis.